

Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1-9 (Canceled)

Claim 10 (Currently Amended): A semiconductor device produced in accordance with the method of claim 23 ~~[[9]]~~.

Claim 11 (Currently Amended): The method of controlling semiconductor manufacturing equipment of claim 23 ~~[[9]]~~, wherein the ~~at least one parameter~~ plurality of data is plasma emission intensity.

Claim 12 (Currently Amended): The method of controlling semiconductor manufacturing equipment of claim 23 ~~[[9]]~~, further comprising generating an alarm when the Mahalanobis distance exceeds the threshold value.

Claims 13-16 (Canceled)

Claim 17 (Currently Amended): The method of controlling semiconductor manufacturing equipment of claim 23 [[13]], further comprising:

standardizing the plurality of data obtained by said sampling to provide standardized data used during said generating a correlation matrix,

wherein [[the]] said standardizing calculator uses an equation

$$Y_{n,m} = (Y'_{n,m} - Ave_n)/\sigma_n,$$

wherein $Y'_{n,m}$ is a sample data at an appointed time X_n in m time sampling, Ave_n is an average of a group of sample data measured at time X_n , σ_n is a standard deviation of data at time X_n , and $Y_{n,m}$ is a standardized sample value at X_n ,

whereby n is an integer from 1 to n and m is an integer from 1 to m .

Claim 18 (Currently Amended): The method of controlling semiconductor manufacturing equipment of claim 17, wherein [[the]] said generating a correlation matrix calculator uses an equation

$$r_{ij} = r_{ji} = \frac{1}{m} \sum_{p=1}^m Y_{i,p} Y_{j,p} ,$$

wherein r_{ij} and r_{ji} are matrix elements and i and j are integers from 1 to n .

Claim 19 (Currently Amended): The method of controlling semiconductor manufacturing equipment of claim 18, wherein said generating a Mahalanobis distance ~~the value calculator~~ uses an equation

$$D^2 = \frac{1}{n} \sum_{i=1}^n \sum_{j=1}^n a_{ij} Y_i Y_j,$$

wherein D is the Mahalanobis distance ~~similarity value~~ and a_{ij} are matrix elements of ~~[[an]]~~ the inverse matrix of the set of matrix elements obtained by the matrix calculator during said obtaining.

Claim 20 (Currently Amended): The method of controlling semiconductor manufacturing equipment of claim 23 ~~[[19]]~~, wherein the threshold value is within a range of 2 to 4.

Claims 21-22 (Canceled)

Claim 23 (New): A method of controlling semiconductor manufacturing equipment, comprising:

- sampling a plurality of data;
- generating a correlation matrix based on the plurality of data;
- generating an inverse matrix of the correlation matrix in order to generate a Mahalanobis space;

generating a Mahalanobis distance based on the Mahalanobis space; and
generating a control signal which indicates that an operation of the
semiconductor manufacturing equipment should be stopped when the Mahalanobis
distance exceeds a threshold value.

Claim 24 (New): The method of controlling semiconductor manufacturing equipment
according to claim 23, wherein the plurality of data are sampled based on a light
intensity of plasma in a reaction chamber.

Claim 25 (New): The method of controlling semiconductor manufacturing equipment
according to claim 23, wherein the plurality of data are sampled based on a change in
an impedance of a reaction chamber.

Claim 26 (New): The method of controlling semiconductor manufacturing equipment
according to claim 25, wherein the change in the impedance is based on a change in a
voltage of a high frequency to be supplied to an electrode in the reaction chamber.

Claim 27 (New): The method of controlling semiconductor manufacturing equipment
according to claim 23, wherein the plurality of data are sampled based on a voltage, a
current and a phase of a supplied high frequency electric power.